

Attorney Docket No.: WON-0003
Inventors: Kwak et al.
Serial No.: 10/519,511
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REMARKS

Claims 1 through 3 and 7 through 9 are pending in the instant application. Claims 1 through 3 and 7 through 9 have been rejected. The specification and claims 1 and 7 have been amended to correct an inadvertent typographical error. No new matter is added by these amendments. Reconsideration is respectfully requested in light of these amendments and the following remarks.

I. Objection to Claim 7

Claim 7 has been objected to for misspelling of the word "chloride". Accordingly, claims 1 and 7 and the specification have been amended to correct this inadvertent typographical error. Withdrawal of this objection is therefore respectfully requested.

II. Rejection of Claims 1-3 and 7-9 under 35 U.S.C. 103(a)

Claims 1-3 and 7-9 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Byth et al. (2000) in view of Ichinose et al. (1995).

Applicants respectfully traverse this rejection.

To establish a *prima facie* case of obvious, three basic criteria must be met. First there must be some suggestion or motivation to modify the teachings of the reference. Second, there must be a reasonable expectation of success.

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Finally the prior art must teach or suggest all the claim limitations. MPEP §2143.

The cited combination of references does not meet these three criteria.

At the outset, Applicants respectfully disagree with the Examiner's characterization of the teachings of the cited references.

Contrary to the Examiner's suggestion, Byth et al. does not teach a high throughput method for screening for a modulation in plant cell growth. Instead, Byth et al. demonstrates that the Alamar Blue (AB) assay, commonly used to assess quantitatively the viability and/or proliferation of mammalian cells and microorganisms, is adaptable for the determination of the viability of plant cells. Byth et al. used cell suspension culture of tomato as the experimental model for a comparison of the AB assay with the conventional TTC viability assay. Tomato suspension cells in multi-well plates were inoculated with a suspension of a virulent bacterium, *R. solanacearum* and the viability of the cells was determined using the TTC and AB assay. The stated objective of this paper was to adapt the AB assay in order to determine the viability of plant cells and to compare the developed assay with the commonly used TTC viability assay

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of plant cells (see page 341 left column, lines 42-47). Nowhere, however, do Byth et al. teach or suggest that this method in plant cell cultures can be used in a high throughput screening assay such as the present invention which analyzes activity of abundant compounds simultaneously in photomixotrophic cells with small amounts of samples (see page 5 of the instant specification).

The secondary reference of Ichinose et al. also provides no teaching or suggestion of a high throughput assay. Ichinose et al. performed experiments to investigate the mechanism of action of phthalimide herbicide, known as a Protox inhibitor. Photomixotrophic cells, *Nicotiana tabacum*, were used because phthalimide herbicide attacks the chlorophyll biosynthetic pathway in the chloroplast. For these experiments, they first selected a phthalimide herbicide resistant cell line, YZ1-1S. Phthalimide was added to the medium of wild type cells and resistant cells (12.5 mL samples); the cells were harvested after 5 days of growth; and chlorophyll content of the cells was measured. Clearly this assay, with its large sample size and long growth period, is inappropriate for a high throughput screening assay such as the present invention which analyzes activity of abundant compounds simultaneously in

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photomixotrophic cells with small amounts of samples (see page 5 of the instant specification).

Teachings in Ichinose et al. at page 695, suggested by the Examiner to teach a high throughput assay, are related to a method for selecting resistant cells and characterization thereof. This assay is in no way related to the instant invention which provides a method for high throughput screening of plant growth regulators.

Accordingly, since neither of the cited references teach or suggest a high throughout screening assay to identify plant growth regulators, the cited combination of references fails to teach or suggest all the limitations of the instant claimed invention.

Further, since the objectives of these references were unrelated to developing a high throughput assay for screening for plant growth regulators, which analyzes activity of abundant compounds simultaneously in photomixotrophic cells with small amounts of samples, these references fail to provide the requisite motivation to modify their teachings to arrive at the instant invention.

Finally, since neither of the cited references teach or suggest high throughput screening assays nor identified plant growth regulators with photomixotrophic cells, the cited combination of references provides no reasonable

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expectation of success that photomixotrophic cell cultures used in the high throughput assay of the present invention would exhibit results consistent with intact plants so that plant growth regulators could be identified. It has been established in the art that it is difficult to predict herbicidal activities of test compounds without evaluating responses in intact plants because the processes such as uptake, translocation and metabolism of test compounds are complicated and cannot be accurately elucidated in plant cell culture. For example, Asami et al. Agric. Biol. Chem. 1987 51:205-210 taught a photosynthetic electron transport inhibiting compound with strong activity confirmed by Hill reaction using thylakoid membrane separated from chloroplast which did not exhibit herbicidal activity in intact plants. It was not until the instant inventors herein performed experiments such as presented in Example 4 of the instant specification that the predictiveness of photomixotrophic cells in identifying plant growth regulators was recognized.

Thus, the cited combination of references fails to meet the basic criteria required to render obvious the instant claimed invention.

Withdrawal of this rejection under 35 U.S.C. 103(a) is therefore respectfully requested.

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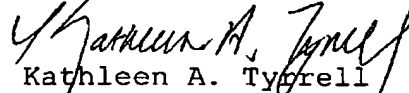
III. Conclusion

Applicants believe that this submission overcomes all pending rejections in this case and comprises a full and complete response to the Office Action of record.

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Accordingly, favorable reconsideration and subsequent allowance of the pending claims is earnestly solicited.

Respectfully submitted,


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